TYPE APPROVAL CERTIFICATE

Certificate no.:
TAE000038D
Revision No:
4

This is to certify:

that the Electric Power Cable

with type designation(s)
BFOU P5 or P5/P12 or P105 or P105 M 0,6/1kV, BFOU-VFD 0,6/1kV, BFOU-VFD 1,8/3kV

issued to
Untel Kablolari San. ve Tic. A.S.
Dilovası, Türkiye

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Low voltage power cables.
Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Type	Rated voltage (kV)	Temp. class (°C)
BFOU P5 or P5/P12 or P105 or P105 M 0,6/1kV	0,6/1	90
BFOU-VFD 0,6/1kV	0,6/1	90
BFOU-VFD 1,8/3kV	1,8/3	90

Issued at **Høvik** on **2024-08-16**

This Certificate is valid until **2029-01-16**.
DNV local unit: **Istanbul**

Approval Engineer: **Ivar Bull**

for **DNV**
Digitally signed by Elter, Frederik Tore
Location: DNV Høvik, Norway

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

BFOU P5 or P5/P12 or P105 or P105 M 0,6/1kV,
BFOU-VFD 0,6/1kV,
BFOU-VFD 1,8/3kV

Construction:

Conductors:	Tinned stranded copper class 2 or class 5
Earth conductors	3x distributed earth conductors in interstices (VFD cables)
Core insulation:	Mica tape + EPR or HEPR
Bedding:	Halogen free compound
Metal covering:	Tinned copper wire braid / Cu/PET tape + TCWB (VFD cables)
Outer sheath:	SHF2 Mud / SHF2

BFOU P5 or P5/P12 or P105 or P105 M 0,6/1kV,

No of cores:	Cross sectional area [mm^2]
1	1,5 – 400
2	1,5 – 240
3	1,5 – 300
4, 5	1,5 – 240
7, 10, 14, 19, 24, 30, 37	1,5 2,5

BFOU-VFD 0,6/1kV and BFOU-VFD 1,8/3kV

No of cores:	Cross sectional area [mm^2]
3 / 3E	10 – 240 / 4-50

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331.

The requirements of SOLAS Amendments Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bunches of Cables or Wires) are fulfilled without any additional measures.

General power and lighting.
Fire resistant. Flame retardant in bunch Cat. A. Halogen free. Low smoke.
Mud resistant.

Type Approval documentation

Data sheet:	FR 72-017 rev.0 01.05.2010
	BFOU-VFD Cable 0,6/1kV and 1,8/3kV Rev 0 Mar 15.2021
Test report:	Type test report
	Fire test with shock, dated 2014-05-12
	TYPE TEST PROCEDURE & PLAN RFOU VFD 1,8/3kV dated 26.06.2021
	Fire resistance test report No 120_2021 dated 26.06.2021

Tests carried out

Standard	Release	General description	Limitation
DNV CP-0399	2021-08	Electric cables.	
IEC 60092-350	2020-01	Electrical installations in ships - Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-360	2021-01	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables	
IEC 60092-353	2024-06	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	

Standard	Release	General description	Limitation
IEC 60331-1/2	2018-03	Tests for electric cables under fire conditions - Circuit integrity - Part 1/2: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter exceeding / not exceeding 20 mm	Minimum 120 min+15 min cooling down time
IEC 60332-3-22	2018-07	Tests on electric and optical fibre cables under fire conditions - Part 3-22: Test for vertical flame spread of vertically mounted bunched wires or cables - Category A	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
IEC 60754-1	2019-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2019-11	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus Part 2: Test procedure and requirements	Low smoke Light transmittance >60%
NEK TS606 Ed6	2022-03	Cables for offshore installations - halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS). Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. EDC 95/11 70°C 56d

Marking of product

ÜNTEL–BFOU (NEK 606 P5 or P5/P12 or P105 or P105 M – size –0,6/1 kV - IEC 60332-3-22 – IEC 60331-1/2 – Lot No
or
ÜNTEL – BFOU VFD 0,6/1kV or 1,8/3kV – size – IEC 60332-3-22 – IEC 60331-1/2 – Lot No

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE